WHAT IS CLAIMED IS:

1. An optical head device comprising:

a first light source for emitting a light beam of a first wavelength;

a second light source which emits a light beam of a second wavelength differing from said first wavelength;

a single block wherein the first and the second light source are aligned thereon; and

a diffraction grating which is provided on the optical path between said first light source and an objective lens and on the optical path between said second light source and the objective lens and which has a first-order diffraction efficiency of almost zero for the light beam from said first light source and emits the first-order diffraction light for the light beam from said second light source.

2. The optical head device according to claim 1, wherein the depth h0 of the grating groove of said diffraction grating is expressed by

$$h0 = m \cdot \lambda 1/(n - 1)$$

where n is the refractive index of said diffraction grating, $\lambda 1$ is the wavelength of said first light source, and m is a natural number.

3. The optical head device according to claim 2, wherein said m is 1.

4. The optical head device according to claim 1,

wherein the first-order diffraction light from said second light source is used to sense a tracking error signal.

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5. The optical head device according to any one of claims 1 to 4, wherein said first light source and second light source are a multi-wavelength semiconductor laser array.

6. An optical head device comprising:

a first light source for emitting a light beam of a first wavelength;

a second light source which emits a light beam of a second wavelength differing from said first wavelength;

a single block wherein the first and the second light source are aligned thereon;

a first diffraction grating which has a first-order diffraction efficiency of almost zero for the light beam from said first light source and emits the first-order diffraction light for the light beam from said second light source; and

a second diffraction grating which emits the first-order diffraction light for the light beam from said first light source and has a first-order diffraction efficiency of almost zero for the light beam from said second light source.

7. The optical head device according to claim 6, wherein the depth h01 of the grating groove of said

first diffraction grating is expressed by

$$h01 = m \cdot \lambda 1/(n1 - 1)$$ and

the depth h02 of the grating groove of said second diffraction grating is expressed by

$$h02 = m \cdot \lambda 2/(n2 - 1)$$

where n1 is the refractive index of said first diffraction grating, n2 is the refractive index of said second diffraction grating, $\lambda 1$ is the wavelength of said first light source, $\lambda 2$ is the wavelength of said second light source, and m1 and m2 are natural numbers.

8. The optical head device according to claim 7, wherein at least one of said m1 and m2 is 1.

9. The optical head device according to any one of claims 6, 7 and 8, wherein said first diffraction grating and said second diffraction grating are formed integrally on a substrate.

10. An optical head device comprising:

a first light source for emitting a light beam of a first wavelength;

a second light source which emits a light beam of a second wavelength differing from said first wavelength;

a single block wherein the first and the second light source are aligned thereon; and

a hologram which projects a light beam onto a recording medium and directs the reflected light from the recording medium to a photodetector, wherein

said hologram is a nonpolarization hologram.

11. The optical head device according to claim 10, wherein said nonpolarization hologram has an asymmetrical grating.

12. The optical head device according to claim 10, wherein said nonpolarization hologram has a blaze grating.

13. The optical head device according to claim 10, wherein said nonpolarization hologram has an asymmetrical stepwise grating.

14. An optical head device comprising:

a first light source for emitting a light beam of a first wavelength;

a second light source which emits a light beam of a second wavelength differing from said first wavelength;

a single block wherein the first and the second light source are aligned thereon; and

an objective lens for causing the light beams from said first light source and second light source to converge on a recording medium, wherein

the optical axis of said objective lens is positioned asymmetrically with the optical axes of said first and second light sources.

15. The optical head device according to claim 13, wherein said recording medium includes a first disk to be read from when said first light source is used and

a second disk to be read from when said second light source is used and satisfies the following expressions:

$t1 < t2$ and $\delta 1 > \delta 2$

where t1 is the substrate thickness of the first disk, t2 is the substrate thickness of the second disk, $\delta 1$ is the distance between the optical axis of said first light source and that of said objective lens, and $\delta 2$ is the distance between the optical axis of said second light source and that of said objective lens.

16. The optical head device according to claim 14, wherein the optical axis of said second light source almost coincides with the optical axis of said objective.

17. The optical head device according to claim 14, wherein said first and second light sources are composed of a multi-wavelength laser array.

18. An optical head device comprising;

a first light source for emitting a light beam of a first wavelength;

a second light source which emits a second wavelength differing from said first light wavelength;

a single block wherein the first and the second light source are aligned thereon; and

an objective lens for causing the light beams from said first light source and second light source to converge on a recording medium, wherein

the position of the optical axis of said objective

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lens is disposed at least between the optical axes of beams of said first and second light sources, and the optical axis of said objective lens coincide with the optical axis of the beam of light of a shorter wavelength than another one, or disposed to near position to the optical axis of the beam of light of shorter wavelength than the beam of light of a longer wavelength.

19. The optical head device according to claim 18, wherein said recording medium includes a first disk to be read from when said first light source is used and a second disk to be read from when said second light source is used and satisfies the following expressions;

$t1\ (DVD) < t2\ (CD) \quad \delta 1\ (DVD) < \delta 2\ (CD)$

where t1 is the substrate thickness of the first disk, t2 is the substrate thickness of the second disk, $\delta 1$ is the distance between the optical axis of said first light source and that of said objective lens, and $\delta 2$ is the distance between the optical axis of said second light source and that of said objective lens.

20. The optical head device according to claim 18, wherein said first and second light sources are composed of a multi-wavelength laser array.

21. An optical head device comprising:

a first light source for emitting a light beam of a first wavelength;

a second light source which emits a light beam of

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a second wavelength differing from said first wavelength;

an objective lens for causing the laser light from said first or second light source to converge on an optical disk;

a single block wherein the first and the second light source are aligned thereon; and

a hologram for diffracting the light reflected from said optical disk and returned through said objective lens and directing the reflected light to a light-receiving element, wherein

the center of said hologram is aligned with the midpoint between the optical axis of said first light source and that of said second light source in projection on said hologram.

22. The optical head device according to claim 21, wherein, if the distance between the center of said hologram and the optical axis of said first light source is $\delta 1$ and the distance between the center of said hologram and the optical axis of said second light source is $\delta 2$ in a projection plane in the direction of the optical axis of said objective lens, the equation $\delta 1 = \delta 2$ is almost satisfied.

23. The optical head device according to claim 21, wherein, if the distance between the center of said hologram and the optical axis of said first light source is $\delta 1$ and the distance between the center of

said hologram and the optical axis of said second light source is $\delta 2$ in a projection plane in the direction of the optical axis of said objective lens, the expression $\delta 1 < \delta 2$ is almost satisfied.

24. The optical head device according to claim 21, wherein said hologram is used to sense a shift in focus by a mixed aberration method.

25. An optical head device comprising:

a first light source for emitting a light beam of a first wavelength;

a second light source which emits a light beam of a second wavelength differing from said first wavelength;

a single block wherein the first and the second light source are aligned thereon;

an objective lens for causing the laser light from said first or second light source to converge on an optical disk; and

a hologram for diffracting the light reflected from said optical disk and returned through said objective lens and directing the reflected light to a light-receiving element, wherein

if the distance between said first light source and said second light source is δ, the distance between said first and second light sources and said hologram is in the range from 20δ to 40δ.

26. The optical head device according to claim 25,

wherein said hologram is a nonpolarization hologram.

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27. An optical head device comprising:

a first light source for emitting a light beam of a first wavelength;

a second light source which emits a light beam of a second wavelength differing from said first wavelength;

an objective lens for causing the laser light from said first or second light source to converge on an optical disk;

a single block wherein the first and the second light source are aligned thereon; and

a hologram for diffracting the light reflected from said optical disk and returned through said objective lens and directing the reflected light to a light-receiving element, wherein

said hologram has a first marker attached to the projected position in the direction of the optical axis of said second light source, the first marker serving as a mark in installing said hologram.

28. An optical head device comprising:

a first light source for emitting a light beam of a first wavelength;

a second light source which emits a light beam of a second wavelength differing from said first wavelength;

an objective lens for causing the laser light

from said first or second light source to converge on an optical disk;

a single block wherein the first and the second light source are aligned thereon; and

a hologram for diffracting the light reflected from said optical disk and returned through said objective lens and directing the reflected light to a light-receiving element, wherein

said hologram has a first marker attached to the position of the midpoint between the projected position in the direction of the optical axis of said first light source and the projected position in the direction of the optical axis of said second light source, the first marker serving as a mark in installing said hologram.

29. The optical head device according to any one of claims 26 and 27, wherein, if the numerical aperture when the light beam from said first light source is used is NA1 and the numerical aperture when the light beam from said second light source is used is NA2, the expression NA1 > NA2 is satisfied.

30. The optical head device according to any one of claims 27 and 28, wherein said hologram has a second marker attached to the position corresponding to an optical axis extending to any point on said light-receiving element.

31. The optical head device according to claim 30,

wherein said any point is the center of said light-receiving element.

32. The optical head device according to claim 30, wherein said any point is the marker provided on said light-receiving element.

33. A disk drive system comprising:

a first light source for emitting a light beam of a first wavelength;

a second light source which emits a light beam of a second wavelength differing from said first wavelength;

a single block wherein the first and the second light source are aligned thereon; and

a diffraction grating which is placed on the optical path between said first light source and an objective lens and on the optical path between said second light source and the objective and which produces almost 100% of the 0-order diffraction light for the light beam from said first light source and has a first-order diffraction efficiency of almost zero and emits the 0-order and first-order diffraction light for the light beam from said second light source;

a hologram which is placed on the optical path between said objective lens and said diffraction grating and directs the light projected on an optical disk via said objective lens and reflected from the optical disk via said objective to a light-receiving

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element; and

a signal processing circuit which processes the photoelectric conversion output from said light-receiving element and subjects the photoelectric conversion output of the reflected light corresponding to said first-order diffraction light to a tracking error process and obtains a signal playback output and/or a tracking error signal by phase sensing for the photoelectric conversion output of the reflected light corresponding to the 0-order diffraction light.